Volume 14 | Issue 3 Article 4

1952

An Unusual Case of Alveolar Periostitis In a Horse

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Fig. 1. Two trephine openings were required.

ALVEOLAR periostitis is a common dental disease of the horse. It is the result of any process which exposes the alveolar periosteum to the action of an irritant. These underlying or causative conditions include such processes as fractures of the teeth, fractures of the mandible or maxilla, wearing the occlusal surface below the gum-line, separation of the tooth and gum by coarse food or dental tartar, deep caries, and canals in the infundibulum due to incomplete filling by cement during the early development of the tooth.

Two types of alveolar periostitis are recognized, chronic ossifying and acute suppurative. The former type is encountered most often in young animals and is characterized by a slight circumscribed enlargement of the bone. The acute suppurative form follows the infection of the alveolar preiosteum by pyogenic bacteria. When the pyogens enter through an opening in the infundibulum sometimes there are few symptoms of infection around the involved tooth. The necrotic process gradually extends from the alveolar periosteum to the bone. When this process involves the lower cheek teeth or the first two upper cheek teeth a fistulous tract is often the first symptom noted by the owner. A foul-smelling unilateral nasal discharge may be the first symptom noted when the process involves the third, fourth, fifth, or sixth upper cheek teeth as a result of involvement of the maxillary sinus. The infection usually involves only one tooth, but may extend to adjacent teeth and sometimes several are affected.

History and Diagnosis

In August 1951, a letter inquiring about the advisability of bringing a 12-year-old gelding to the clinic was received. The horse was described as having a bad tooth, urinating frequently, and remaining in poor general condition. On Jan. 2, 1952, this horse was brought to the clinic. Upon examination, it was noted that the horse salivated excessively, repeatedly protruded his tongue, but was not sensitive about the mouth. Oral examination revealed only that the left fourth upper

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cheek tooth was shorter than the third and fifth.

Radiograms were made of the upper cheek teeth. The teeth of the right arcade were normal, but the radiogram of the left side revealed a chronic alveolar periostitis of the fourth upper cheek tooth. The fourth tooth was confirmed to be shorter than the third and fifth and was apparently wedged in by these two teeth. The radiogram also showed greater density of bone above the third, fourth and fifth teeth, indicating extensive involvement of maxilla. See Fig. 2 a.

On January 11, 50 Gm. of chloral hydrate in solution was given orally and the patient was placed on the operating table. An area bounded dorsally by an imaginary line passing through the medial canthus of the eye and the infraorbital foramen, and ventrally by the facial crest was cleaned, shaven, and tincture of iodine applied.

Removal of the Tooth

The site selected for the trephine opening was just ventral to an imaginary line connecting the medial canthus of the eye and the infraorbital foramen, at a point perpendicular to the posterior edge of the occlusal surface of the fourth cheek tooth. This site avoided damage to the osseous lacrimal canal and also compensated for the natural backward curvature of the root of the tooth.

The tissues at the chosen site were infiltrated with a 2 percent procaine solution, and the maxillary nerve was blocked in the area of the spheno-palatine fossa with 10 ml. of the same solution. When anesthesia was attained a portion of the maxillary bone ¾ in. in diameter was exposed by excision of the soft tissues at the previously determined site. A piece of bone about ¾ in. in diameter was removed with a semi-circular bone chisel. This opened the maxillary sinus, and the root of the fourth cheek tooth was visible directly beneath the opening.

A punch and mallet were used in repelling the tooth. In the attempt to repell the fourth tooth it was found that the third and fifth teeth had it wedged in too tightly to be forced downward. Adding to this difficulty was the new bone which had been produced around the root of the tooth as a result of the infection. The fifth upper cheek tooth was cut off approximately at the gum line to make room for the fourth tooth to pass downward, and the tooth was repelled without further difficulty. When the repelled tooth was examined it was found to have an imperfectly closed infundibulum.

The alveolus was curetted and irrigated with warm $KMnO_4$ (1:3000) solution. A rolled gauze pack was prepared which was slightly greater in diameter than the cavity from which the tooth had been repelled. A piece of ⅜ in. cotton tape was tied securely around the middle of the gauze pack in such a way that the ends of the tape extended from the knot about twelve inches. Both ends of the cotton tape were then threaded through the alveolus, the maxillary sinus, and out the trephine opening. While one hand was used to pull on the tape the other was used to guide the cylindrical gauze pack into place, to partially fill the alveolus. The pack was well seated in the alveolus and the ends of the pack did not protrude between the grinding surfaces of adjacent teeth. Another gauze pack, made in the same manner as the first, was used to cover the trephine opening. This pack was placed over the trephine opening, and the two ends of the cotton tape extending from the first pack were used to secure it. Prior to placing either pack into position, the part of it which was to contact the tissue was covered with a commercial sulfanamide solution consisting of sulfanilamide, sulfathiazole and urea in propylene glycol. After the second day, the wound was cleaned, irrigated with warm potassium permanganate solution (1:3000) and a new pack with the commercial sulfanomide solution was applied daily.

Postoperative Care

A mouth speculum was used while changing the packs. The pack over the trephine opening was removed and a new piece of cotton tape was tied to the ends of the old tape to aid in pulling the

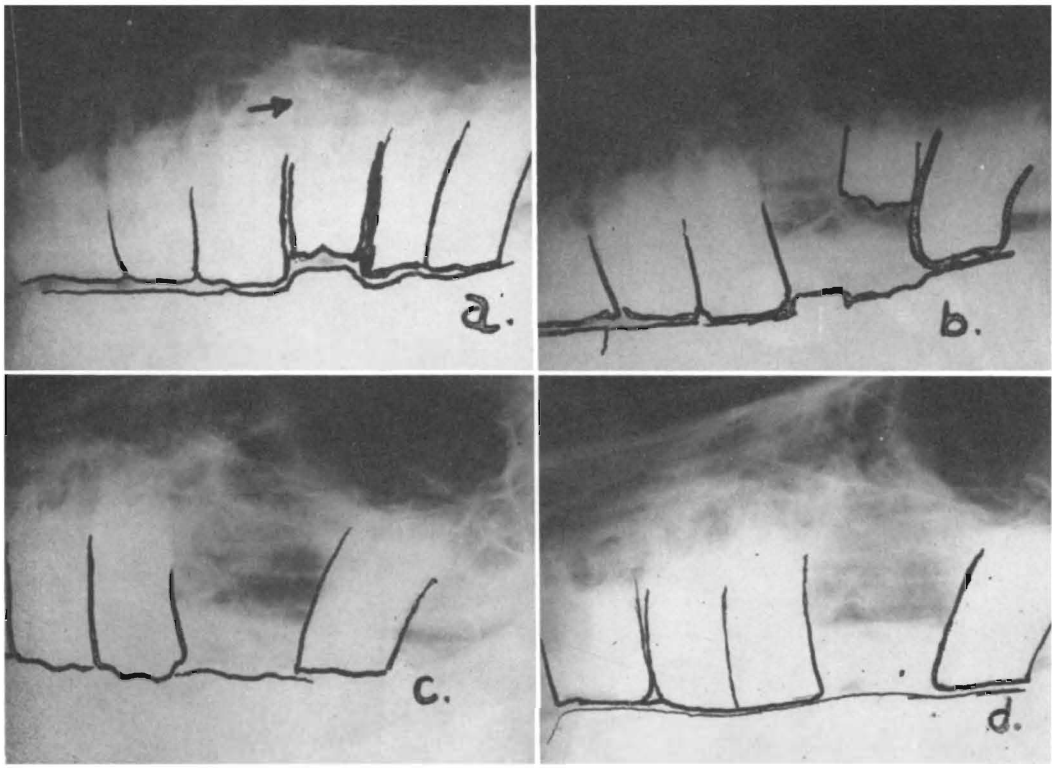

Fig. 2. Radiograms of the case described. (a) On admission. Arrow points to new bone formation (b) after fourth cheek tooth was removed (c) after fifth cheek tooth was removed (d) 37 days after removal of the fifth cheek tooth — a large cavity remained in the maxilla.

tapes of the new pack from the mouth through the trephine opening. The mouth was opened, the old pack was pulled out of the mouth and cut loose from the piece of tape which had been drawn in through the trephine opening. The ends of the tape on the new pack were tied to this tape, and the new pack was seated as previously described. A fresh pack containing the sulfonamide solution was placed over the trephine opening and retained by the tape ends from the inner pack. The fact that horses are more cooperative if their mouths are held open only when absolutely necessary was always respected while changing the pack.

On the second day after the operation, the patient ate grain and hay without any apparent disturbances in mastication.

Thirteen days postoperatively, the face began to swell in the area of the trephine opening and around the nose. Hot water was run over the part of the head below the eyes for one-half hour each day. Five Gm. of aureomycin hydrochloride with sodium glycinate were injected intravenously daily for three days. This therapy was stopped, even though considerable swelling was still present, because the aureomycin caused the patient to go off feed. The patient was emaciated and in poor condition, consequently it was considered imperative that the patient eat well.

Additional Survery Required

A radiogram was made of the left upper cheek teeth and it revealed that the roots of the fifth tooth were now infected. On January 31, the patient was prepared for repulsion of a tooth in the usual manner. A trephine opening one inch posterior to the first trephine opening was made, and the fifth cheek tooth was repelled. The alveolus was curetted and irrigated with warm potassium permanganate solu-

tion. The patient now had two trephine openings over the maxillary sinus, but only one large cavity in the location of the fourth and fifth alveoli. One large gauze pack was rolled to fit the combined alveoli. A piece of cotton tape was tied 1 in. from each end to secure the separate packs which were used over the trephine openings.

The horse was given 3,000,000 units of procaine penicillin in oil intramuscularly daily for the next five days. The sulfonamide treated packs were changed daily. Ten days after the second operation, another radiogram was made. It revealed the cavity in the maxilla produced by the expulsion of the fourth and fifth teeth, but further infection was not evident.

By February 25, the first trephine opening was closed. On March 1, the teeth on the lower jaw opposite the cavity in the upper jaw were floated. These teeth will not be worn off in the process of mastication, therefore it will be necessary to cut them at regular intervals to prevent their becoming too long. By March 14, the second trephine opening had filled in enough so that it was difficult to put in a new pack without damaging the granulation tissue at the trephine opening.

A large cavity in the upper jaw, which had to be protected, still remained. To remedy this situation, a mass of dental impression wax was heated in hot water. While the wax was hot, it was molded to the approximate form of the cavity and forced into position while still pliable. When the wax cooled to body temperature it became hard, and fitted the space snugly enough to be self retaining and to prevent food particles from becoming impacted in the cavity. The wax pack will be gradually forced out and worn off as granulation tissue slowly fills in the cavity. A small amount of pus came from the trephine opening, but the quantity decreased as the opening became smaller. The granulating trephine opening was treated as an open wound.

Prognosis

If any other teeth should develop alveolar periostitis, an attempt will be made to control the bone infection with aureomycin hydrochloride since the horse is in good enough condition to tolerate being off feed for a time. Re-operation is not considered practical, because of the large amount of bone which has already been removed, and the danger that a cavity produced by repelling an adjacent tooth would not close.

Outstanding features of this case were as follows:

1. The length of time which elapsed between the recognition of the diseased tooth and the request for treatment.
2. Wedging in of the fourth tooth by the third and fifth teeth.
3. Damage to the fifth tooth was necessary to remove the fourth tooth.
4. Subsequent infection and removal of the fifth tooth.
5. The wide area of bone infection around fourth tooth, enveloping the third and fifth teeth.
6. The large cavity in the maxilla and resulting failure of the cavity to close.
7. Two trephine openings in the maxillary sinus.

The owner will be advised to put the horse on pasture when he is taken home. It is believed that being in sunshine and on good pasture will help stimulate the healing process.

Trembles, poisoning by white snakeroot, ranked as a major death hazard during the era of pioneer settlements. Most of the human cases occurred after drinking milk from cows grazing on the toxic weeds. Even today the symptomatology of trembles in cattle and man should be kept in mind by veterinarians, for sporadic cases are reported annually. A number of white snakeroot poisonings have been diagnosed in Missouri cattle in recent years.